

## **REMARKS**

In the non-final office action mailed December 11, 2006, claims 1-27 were examined and stand rejected. Claims 28-40 have been canceled without prejudice to consideration in a continuing application. The abstract and claim 6 have been amended. A declaration of the sole inventor in accordance with 37 CFR §1.131 accompanies this response (the "Declaration"). Reconsideration of the present application as amended in view of the remarks that follow is respectfully requested.

### **Amendment to the Specification**

The specification was objected to because of a misspelling in line one of the abstract. Line 1 of the abstract has been amended as suggested in the Office Action. Also, guidelines were presented regarding the preferred layout of the specification. It is believed the current format of the application as amended should be acceptable.

### **Claim Rejection Under §112, paragraph 2**

Claim 6 was rejected under 35 USC §112, second paragraph as being indefinite due to a lack of antecedent basis for "said forming" in line 2. Accordingly, "forming" has been replaced with "performing" which is introduced in base claim 1. It is believed that this amendment addresses concerns raised under §112, paragraph 2.

### **Claim Rejections based on Prior Art**

Claims 1-3, 5, 6, 8-11, 13-8, 20-22, and 26-27 were rejected under 35 USC §102(e) as being anticipated by Ross et al. (App. Phys. Lett. 2003 83(6) pp1225-1227)

(hereinafter "Ross et al."). Claim 3 was rejected under 35 USC §103(a) as being unpatentable over Ross et al. Claims 4, 12, 19, 23-25 were rejected under 35 USC §103(a) as being unpatentable over Ross et al. in view of Choi (WO 00/08225) (hereinafter "Choi"). Finally, claim 7 was rejected under 35 USC §103(a) as being unpatentable over Ross et al. in view of U.S. Patent number 5,980,983 to Gordon (hereinafter "Gordon").

### **Rule 1.131 Declaration**

Grounds of rejection asserted against claims 1-27 of the present application are based on Ross et al., which is being asserted as anticipatory of some claims and as the primary reference against others in an obviousness context. The Declaration enclosed herewith is submitted in compliance with 37 CFR §1.131. The indicated date of publication of the Ross et al. reference is August 11, 2003 (the "Publication Date"). The present application was filed little more than five weeks later on September 19, 2003 (the "Filing Date"). As established by the enclosed Declaration, the inventors conceived of the inventions defined by claims 1-27 well before the Publication Date.

Furthermore, the Declaration and its exhibits establish substantially continuous and diligent efforts to prepare and file the subject application from a time before the Publication Date through the Filing Date. Accordingly, the Declaration establishes the requisite conception and due diligence from a time prior to the Publication Date to the subsequent constructive reduction to practice that resulted from filing of the Application. Moreover, an actual reduction to practice is further established prior to the Publication Date by the Declaration at least as to the rejected independent claims. Therefore, it is

respectfully submitted that Ross et al. has been overcome in accordance with 37 CFR §1.131. In addition, further reasons support allowance of the claims over the grounds of rejection based on Ross et al. as set forth in the following comments.

### **Rejections over Ross et al.**

Claims 1-3, 5, 6, 8-11, 13-8, 20-22, and 26-27 were rejected under 35 USC §102(a) as being anticipated by Ross et al. and claim 3 was rejected under 35 USC §103(a) as being unpatentable over Ross et al. Ross et al. discloses a film that “consists of high-aspect-ratio 14-15 nm diameter copper columns embedded in, and separated by, matrix of carbonaceous residue” (column 2, lines 12-14) by a process using “ion-induced chemical vapor deposition” (column 1, line 1) at “25°C using 500eV ions at a flux of 10.6μA/cm<sup>2</sup> and with a local copper(I)hfacVTMA pressure of about 0.5mTorr” (column 2, lines 10-11).

Anticipation under 35 U.S.C. § 102(a) requires that each and every element as set forth in a claim be disclosed in a single prior art reference. The features of claim 1 include the vapor deposition of an organometallic to form copper nanostructures that are freestanding during formation. Ross et al. fails to disclose, teach, or suggest such features. The Office Action appears to assert that “freestanding” is defined by the applicant as being vertically aligned without the use of a template or patterning device in an exclusive manner. It is surmised that the Office Action relies on page 3, lines 2-3 of the present application, which states: “As used herein ‘freestanding’ refers to the capability of vertically extending from a base or substrate without support from a template or patterning device.” As depicted in Figure 1 of Ross et al., the nanocellular

copper rods are separated by and surrounded with a supporting carbonaceous material in contact therewith. Accordingly, this carbonaceous material functions as a device defining the pattern occupied by the nanocellular rods (a patterning device) or otherwise provides a template during formation. Indeed, when Ross et al. describes conditions to remove carbon within XPS detection limits (H-atom assisted deposition), a noncolumnar equiaxed microstructure resulted – not a nanostructure as defined in claim 1 (*See*, Ross et al., column 4, page 2, first sentence). This distinction buttresses the role of the carbonaceous material as a patterning device and/or template needed to provide the observed nanocellular rods.

Moreover, while the present application clarifies what “freestanding” refers to, it does not restrictively define it. The role of the carbonaceous material at the boundaries of the rods defies any assertion that the Ross et al. rods are freestanding during formation. Accordingly, claim 1 is not anticipated. Likewise, the other rejected independent claims are not anticipated for at least the same reasons.

Further reasons also support the novelty of rejected independent claim 9 which discloses the deposition of monocrystalline nanowires that are freestanding, among other things. The Office Action states that the monocrystalline structures are inherent in performing the process described by Ross et al. because it is the same as that claimed. To the contrary, the method defined by claim 9 encompasses many different processes. In one nonlimiting example, the method of claim 9 can encompass a process that includes the organometallic compound recited in its dependent claim 12. By its own terms, the Office Action recognizes that Ross et al. does not disclose such a compound. In fact, many such distinctions can be made, including these given in connection with the claim 1

rejection. Thus, the method of claim 9 and the specific process of Ross et al. cannot be considered “the same” or identical. Indeed, Ross et al. focuses on the nanocellular growth of two phases in a single film that results in a combination of rods surrounded by carbonaceous material (entire document). Furthermore, inherency requires that the asserted feature must be a necessary consequence of the express disclosure of Ross et al. There is no evidence to support such a conclusion.

In addition to the reasons supporting novelty of the base claims, further reasons support various dependent claims rejected on the same grounds. For example, claims 2 and 17 both include a monocrystalline feature that is further patentable for at least the reasons this feature is patentable as described in connection with independent claim 9. In another example, dependent claims 10, 22 and 27 recite incorporation into at least one of an integrated circuit device, a device to process signals having a frequency of 100 GHz or more, a displayed device, and a sensing device. The Office Action asserts that because Ross et al. tersely refers to other features for circuit and x-ray mask repair that it somehow discloses the claims features. To the contrary, a “circuit” as recited in Ross et al. encompasses any of a number of different types of discrete component circuitry structures and cannot be reasonably construed to specifically disclose incorporation into an integrated circuit device as defined by these claims. Notably, there is no reference given in the Office Action that discloses a device to process signals having a frequency of 100 GHz or more, a display device, or a sensing device. Thus, numerous additional reasons support novelty of rejected dependent claims.

### **Obviousness Rejection of Claim 3**

In addition, claim 3 is not unpatentable over Ross et al. because of the distinctions discussed above and the fact that a notion to grow individual nanowires with a longer second dimension is not the same as an actual process which is capable of reducing this to practice. The Office Action refers to the second dimension and then references the growth rate information in Ross et al. which does not disclose any information as to the length of the columnar microstructures. Ross et al. only disclosed an ambiguous “high-aspect-ratio” characterization (Figure 1b). Indeed, it is highly speculative that the Ross et al. process could provide such features. Consequently, there would be no reasonable expectation of success as required to establish obviousness.

### **Obviousness Rejections of Other Claims**

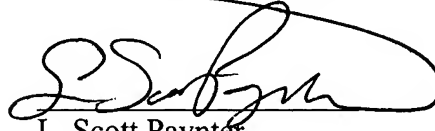
Claims 4, 7, 12, 19, 23-25 were rejected under 35 USC §103(a) as being obvious. These claims are patentable for at least the same reasons that the corresponding base claims are novel. Furthermore, the requisite motivation to combine the references in the manner asserted has not been given as required to establish obviousness.

### **Conclusions**

In view of the forgoing, it is believed that claims 1-27 are in condition for allowance. Reconsideration of the present application as amended is respectfully

requested. The Examiner is invited to contact the undersigned by telephone to address any outstanding matters concerning the present application.

Respectfully submitted:

A handwritten signature in black ink, appearing to read "L. Scott Paynter", written over a horizontal line.

L. Scott Paynter

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